
iPS cell smack down

Posted: May 13, 2011

Created: 13/05/2011 - 13:32

Pity the iPS cell -- it's had quite a ride this year. On the upside, cells reprogrammed from people with autism, Parkinson's disease and schizophrenia were used to create the first ever models of those diseases in a dish. Those models could provide a way of testing drugs on actual human cells. That's good.

But in the same year, a number of studies found significant genetic differences between reprogrammed iPS cells and their embryonic counterparts (here's our blog entry). Today, a paper published in *Nature* by CIRM grantee Yang Xu at the University of California, San Diego found that the cells can also be rejected by the body.

This finding is a bit of a blow. When Shinya Yamanaka and colleagues first reprogrammed human skin to an embryonic-like state in 2007 the stem cell world was aflutter. These cells were seen by some as a possible replacement for embryonic stem cells, with the advantage that because they could be generated from a person's own skin they would be genetically identical and not get rejected by the immune system.

It turns out the immune system is smarter than that, at least in mice. The mice were able to detect and subsequently reject genetically identical iPS cells.

A New York Times story quotes George Daley of Boston Children's Hospital:

“As with any new technology, there is always this initial phase of infatuation, and then the reality sets in,” said Dr. George Q. Daley, director of the stem cell transplantation program at Children's Hospital Boston. “I think it goes to the heart of the issue of how ignorant we really are in understanding these cells.”

Apparently what made the cells visible to the immune system were the genes that were activated in order to reprogram the cells. The immune reaction varied depending on how the cells were made. This work isn't exactly the death knell for iPS cells, but it does mean that the path to the clinic could be a tricky one.

May 13, *Nature*

CIRM Funding: Yang Xu (TR1-01277)

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Tags: Early Translational, University of California San Diego, Xu

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